



**SBR10U45SP5** 

#### 10A SBR SUPER BARRIER RECTIFIER PowerDI5

### Features

- Designed as Bypass Diodes for Solar Panels
- Selectively Rated for +200°C Maximum Junction Temperature for High Thermal Reliability
- Patented Super Barrier Rectifier Technology (SBR<sup>®</sup>)
- High Forward Surge Capability
- Ultra Low Forward Voltage Drop
- Excellent High Temperature Stability
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- An Automotive-Compliant Part is Available Under Separate Datasheet (SBR10U45SP5Q)

## **Mechanical Data**

- Case: PowerDI<sup>®</sup>5
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.093 grams (Approximate)



## Ordering Information (Note 4)

Part Number	Case	Packaging
SBR10U45SP5-13	PowerDI5	5,000/Tape & Reel

Notes: 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.

2. See http://www.diodes.com/quality/lead\_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.

3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

## **Marking Information**

#### PowerDI5



S10U45S = Product Type Marking Code D'' = Manufacturer's Code Marking K = Factory Designator YYWW = Date Code Marking YY = Last Two Digits of Year (ex: 17 for 2017) WW = Week Code (01 to 53)

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## Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load. For capacitive load, derate current by 20%.

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> Vrwm Vrm	45	V
RMS Reverse Voltage	V <sub>R(RMS)</sub>	32	V
Average Rectified Output Current	lo	10	А
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	IFSM	275	A
Repetitive Peak Avalanche Power (1µs, +25°C)	PARM	30,000	W

### **Thermal Characteristics**

Characteristic		Symbol	Value	Unit	
Thermal Resistance Junction to Ambient (Note 5) Thermal Resistance Junction to Ambient (Note 6)		R <sub>θJA</sub> R <sub>θJA</sub>	73 31	°C/W	
	V <sub>R</sub> ≤ 80% V <sub>RRM</sub>		-65 to +150		
Operating Temperature Range	V <sub>R</sub> ≤ 50% V <sub>RRM</sub>		≤180	°C	
	DC Forward Mode		≤200		
Storage Temperature Range		T <sub>STG</sub>	-65 to +175	°C	

# Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

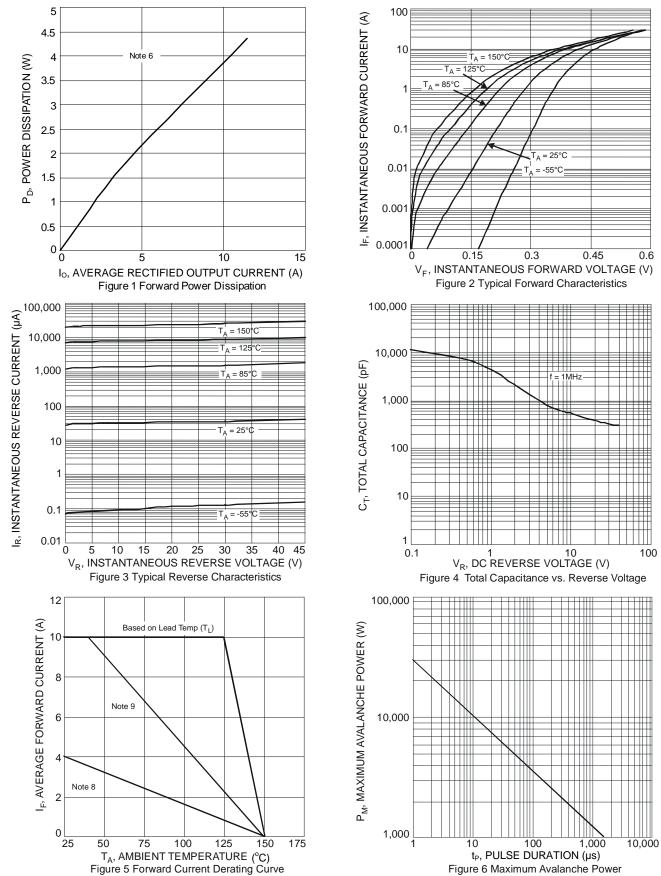
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 7)	V <sub>(BR)R</sub>	45	—	—	V	$I_R = 0.3 mA$
Forward Voltage Drop	VF	 	 0.42 0.38	0.42 0.47 0.41	V	I <sub>F</sub> = 8A, T <sub>J</sub> = +25°C I <sub>F</sub> = 10A, T <sub>J</sub> = +25°C I <sub>F</sub> = 10A, T <sub>J</sub> = +125°C
Leakage Current (Note 7)	IR		0.05 — 28.0	0.3 15 75	mA	$V_R = 45V, T_J = +25^{\circ}C$ $V_R = 45V, T_J = +100^{\circ}C$ $V_R = 45V, T_J = +150^{\circ}C$

Notes:

FR-4 PCB, 2oz. Copper. Minimum recommended pad layout per http://www.diodes.com/package-outlines.html.
 Polymide PCB, 2oz. Copper. Cathode pad dimensions 18.8mm x 14.4mm. Anode pad dimensions 5.6mm x 14.4mm.
 Short duration pulse test used to minimize self-heating effect.



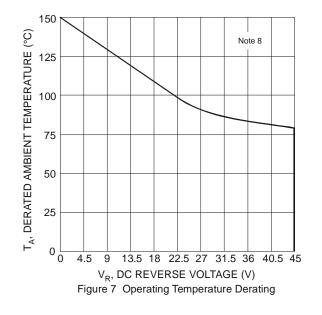
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 Notes:
 8. Device mounted on FR-4 substrate, 2oz copper, with minimum recommended pad layout.

 9. Device mounted on FR-4 substrate, 2oz copper, with 10cm x 10cm pad layout.

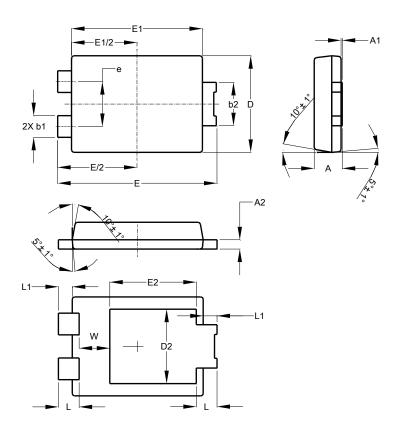






# **Package Outline Dimensions**

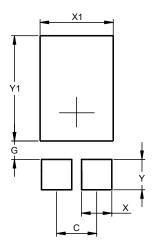
Please see http://www.diodes.com/package-outlines.html for the latest version.



	PowerDI5					
Dim	Min	Max	Тур			
Α	1.05	1.15	1.10			
A1	0.00	0.05				
A2	0.33	0.43	0.381			
b1	0.80	0.99	0.89			
b2	1.70	1.88	1.78			
D	3.90	4.05	3.966			
D2		-	3.054			
E	6.40	6.60	6.504			
е		-	1.84			
E1	5.30	5.45	5.37			
E2			3.549			
L	0.75	0.95	0.85			
L1	0.50	0.65	0.57			
W	1.10	1.41	1.255			
All Dimensions in mm						

## Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.



Dimensions	Value (in mm)
С	1.840
G	0.852
Х	1.390
X1	3.360
Ŷ	1.400
Y1	4.860



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